INTRODUCTION
When managing malignant long bone tumours in skeletally immature patients it is desirable, after resection, to reconstruct with a prosthesis that can be lengthened at appropriate intervals to keep pace with growth of the contralateral side. In an attempt to avoid multiple surgical procedures for lengthening we have recently developed a prosthesis that can be lengthened non-invasively. The shaft of the prosthesis is constructed in two parts allowing length to be telescoped by a power screw jacking the two halves apart during the lengthening procedure. The required lengthening is achieved by placing the limb inside an external circular drive unit. As an electric current is passed through the coil it generates a rotating magnetic field at a speed of 3000 RPM. This captures the implant magnet causing it to rotate in synchronisation, allowing the implant to grow at a rate of 0.23 mm per minute. The purpose of this study was to look at our early experience with the use of these non-invasive growing femoral prostheses.

METHODS
Between November 2002 and February 2004 the prosthesis was implanted in 7 patients (4 males and 3 females) with a diagnosis of osteosarcoma of the distal femur. The patients were aged between 9 and 14 years (mean 11.5 years) at the time of surgery. Patients were lengthened at appropriate intervals in clinics without any form of anesthesia and the process was monitored with scanograms. Total degree of lengthening to date was recorded for each patient together with the range of knee movement and any complications that occurred. Patients were functionally evaluated at their last follow-up visit using the Musculoskeletal Tumour Society (MSTS) Scoring System.

RESULTS
During extension the patient has no sensations of vibration, heat or any form of discomfort. To date patients have been lengthened by an average of 18mm (8-48mm). The mean amount of knee flexion is 125 degrees. The mean MSTS score is 18 (16-21). There have been two complications; one patient developed patella subluxation during the lengthening programme and one patient has required serial casting to treat a flexion deformity of 25 degrees. One patient died due to disseminated carcinomatosis. For post operational treatment, these patients were able to receive radiographic and CT assessments but are not allowed MRI due to magnetic interference on the imaging system.

DISCUSSION
We have been encouraged by our early results with this prosthesis and have been able to demonstrate that the technology works reliably in vivo. We are continuing to use this prosthesis in skeletally immature patients. This prosthesis differs from the Repiphysis™ Limb Salvage System in two distinct points. Firstly, this prosthesis stays in vivo for the continued years of success and doesn't need to be changed or removed at the end of growth phase. Secondly the growth in this prosthesis can be achieved in a controlled and measurable amount.